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(54) Title: GENETIC COMPUTING USING COMBINATORIAL TRANSCRIPTION CONTROL
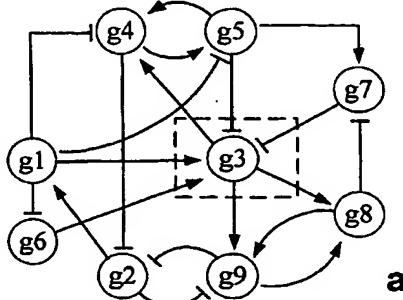
(57) Abstract: A scheme is provided for selecting the regula-
tory DNA sequences to exert combinatorial control of gene tran-
scription in vivo by multiple regulatory proteins, i.e., transcrip-
tion factors (TFs). The method provides the ability to implement
a wide range of complex logic functions through the manipula-
tion of the regulatory DNA sequences, typically several hundred
bases in length. The method includes procedures for selecting
the strengths of the binding sites of different TFs and their rela-
tive positioning in order to implement a plurality of different logic
functions.

a

Ⓐ	Ⓑ	g_1	g_2	g_3	g_4	g_5	g_6
low	low	OFF	OFF	OFF	ON	OFF	ON
high	low	OFF	OFF	ON	ON	ON	OFF
low	high	ON	OFF	ON	ON	ON	OFF
high	high	OFF	ON	ON	OFF	OFF	ON

b

B AND Ā

c
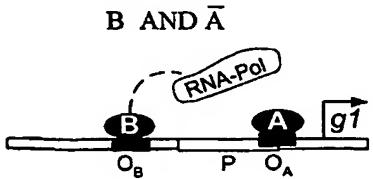
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Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

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